

## DETAILED NVCS VEGETATION CLASSIFICATION ALLIANCE DESCRIPTIONS

### I. FOREST

#### I.A.8.N.c. Conical-crowned temperate or subpolar needle-leaved evergreen forest

##### I.A.8.N.c.2. *JUNIPERUS VIRGINIANA* FOREST ALLIANCE

Eastern Red Cedar Forest Alliance

Hopewell Furnace name: Eastern Red Cedar Woodland

**Concept:** Forests in this alliance are strongly dominated by *Juniperus virginiana* var. *virginiana* on usually high pH, fire-suppressed sites or old fields, but also mature (100+ year) stands, on limestone or chalk, mostly in blacklands, but occasionally on sandstone (e.g., in Oklahoma). This alliance is most common in old fields and pastures, successional cleared land, and other various disturbed areas, especially on calcareous rocks. The growth of *Juniperus virginiana* var. *virginiana* may be very dense, and the stature may be rather low. Other species that may occur in the canopy of Tennessee stands include *Carya alba*, *Carya ovata*, *Cercis canadensis*, and *Pinus virginiana*. Various oaks (including *Quercus coccinea*, *Quercus falcata*, and *Quercus phellos*) also may be present. The midstory is typically sparse, with canopy species as well as *Cornus florida*, *Ilex opaca*, *Liquidambar styraciflua*, and *Prunus serotina* var. *serotina*. *Frangula caroliniana* may occur in several strata. Herb distribution is patchy, and typical species include *Asplenium platyneuron*, *Chasmanthium laxum*, *Eupatorium* spp., *Polystichum acrostichoides*, and *Carex* spp. This vegetation is also found in the Blackbelt of Alabama, on the margins of Chalk Prairies. In the central and upper midwestern United States, stands of semi-natural vegetation dominated by *Juniperus virginiana* var. *virginiana* typically occur in old fields and other disturbed places. The vegetation may vary in structure from open-canopy woodland (particularly as it invades herbaceous old fields) to dense, closed-canopy forest. *Rhus typhina* may be an associate. This semi-natural red cedar forest type is expected to be found in locally disturbed areas.

**Comments:**

**Range:** This alliance is found in Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Iowa, Missouri, Virginia (?), West Virginia (?), Massachusetts, New York, Ontario (Canada), and possibly elsewhere.

**States/Provinces:** AL AR GA IA KY LA MA MO MS NC NY OK ON SC TN TX VA? WV?

**Federal Lands:** COE (J. Percy Priest); DOD (Arnold, Camp Gruber); NPS (Cape Cod, Chickamauga–Chattanooga, Chickasaw NRA, Cowpens, Fire Island, Russell Cave, Shiloh, Stones River); TVA (Columbia, Tellico); USFS (Bankhead, Cherokee?, Daniel Boone, Ouachita, Ozark)

**Synonymy:** T1A9c11a. *Juniperus virginiana* (Foti et al. 1994); Eastern Red cedar: 46, in part (Eyre 1980)

**References:** Andreu and Tukman 1995, Eyre 1980, Foti et al. 1994

**Authors:** D.J. ALLARD, RW, Midwest

**Identifier:** A.137

## I.B.2.N.a. Lowland or submontane cold-deciduous forest

### I.B.2.N.a.24. *LIRIODENDRON TULIPIFERA* FOREST ALLIANCE

#### Tulip Poplar Forest Alliance

Hopewell Furnace name: Tulip Poplar Forest

**Concept:** This alliance includes deciduous forests dominated by *Liriodendron tulipifera*, primarily in areas which were once clearcut, old fields, or cleared by fire or other natural disturbances. These non-wetland forests are also found along mesic stream terraces and on upland mountain benches. Forests in this alliance are abundant in the central and southern Appalachians, below 3000 feet (900 m) elevation, usually associated with disturbance and on the most productive sites, but also occur in the Coastal Plain, Piedmont, Ridge and Valley, and Cumberland Plateau. This alliance includes pure, often even-aged stands of *Liriodendron tulipifera* as well as forests with *Liriodendron tulipifera* associated with other species favored by canopy openings. Associated species vary with geographic location. Throughout most of the range of this alliance, *Acer rubrum*, *Robinia pseudoacacia*, *Betula lenta*, *Acer saccharum*, and *Acer negundo* are common components. In the Piedmont and Coastal Plain, *Liquidambar styraciflua* is a common associate. In the Appalachians, *Halesia tetraptera*, *Tsuga canadensis*, *Tilia americana* var. *heterophylla* (= *Tilia heterophylla*), *Prunus serotina* var. *serotina*, and *Magnolia fraseri* can be additional components. In the Ridge and Valley and Cumberland Plateau, additional species include *Quercus rubra*, *Magnolia acuminata*, *Carya alba*, *Carya glabra*, *Pinus virginiana*, *Sassafras albidum*, *Pinus strobus*, *Carpinus caroliniana*, *Asimina triloba*, and *Staphylea trifolia*. Herbaceous strata are not diverse and, in the southern Appalachians, this feature distinguishes these forests from rich cove forests in I.B.2.N.a *Liriodendron tulipifera*–*Tilia americana* var. *heterophylla*–*Aesculus flava*–*Acer saccharum* Forest Alliance (A.235). Vines can be abundant including *Vitis* spp., *Smilax* spp., *Aristolochia macrophylla*, and *Parthenocissus quinquefolia*. Forests in this alliance occur on middle to lower slopes, sheltered coves and gentle concave slopes, and river terraces over various soils and geologies. Vegetation of this alliance is uncommon in Louisiana.

**Range:** This alliance is found in Alabama, Georgia, Kentucky, Louisiana, Mississippi (?), North Carolina, South Carolina, Tennessee, Maryland, Pennsylvania, Virginia, and West Virginia. Forests in this alliance are abundant in the central and southern Appalachians, below 3000 feet (900 m) elevation, but also occur in the Coastal Plain, Piedmont, Ridge and Valley, and Cumberland Plateau.

**States/Provinces:** AL GA KY MD NC PA SC TN VA WV

**Federal Lands:** DOD (Arnold, Fort Benning); NPS (Blue Ridge Parkway, Great Smoky Mountains, Guilford Courthouse, Harpers Ferry, Kennesaw Mountain, Kings Mountain, Rock Creek, Shenandoah, Shiloh); TVA (Tellico); USFS (Apalachicola, Bankhead, Bienville, Chattahoochee, Cherokee, Conecuh, Daniel Boone, De Soto, George Washington, Holly Springs, Homochitto, Jefferson, Nantahala, Ocala, Oconee?, Osceola, Pisgah, St. Francis, Sumter, Talladega, Tombigbee, Tuskegee)

**Synonymy:** Yellow-Poplar: 57, in part (Eyre 1980)

**References:** Andreu and Tukman 1995, Eyre 1980, Gallyoun et al. 1996, Golden 1974, Horn 1980, McGee and Hooper 1970, Phillips and Shure 1990, Schmalzer 1978, Thomas 1966

**Authors:** D.J. ALLARD, RW, Southeast

**Identifier:** A.236

**I.B.2.N.a.27. *QUERCUS ALBA* (*QUERCUS RUBRA*, *CARYA* SPP.) FOREST ALLIANCE**  
White Oak (Northern Red Oak, Hickory species) Forest Alliance

Hopewell Furnace name: Dry Oak–Mixed Hardwood Forest

**Concept:** This alliance is widely distributed in the eastern United States and portions of adjacent Canada and includes dry mesic to mesic upland oak forests dominated by *Quercus alba* and/or *Quercus rubra*, with or without *Carya* species. Stands are 15-25 m tall, with a closed, deciduous canopy. The shrub and herbaceous strata are typically well-developed. *Quercus alba* usually dominates the stands, either alone or in combination with *Quercus rubra* (especially on moister sites) and sometimes *Quercus velutina* (especially on drier sites). Some associations in this alliance are dominated by *Quercus rubra*, although *Quercus alba* is usually also a canopy component. *Carya* species (particularly *Carya alba*, *Carya glabra*, or *Carya ovata*) are typically common either in the canopy or subcanopy. In the southeastern United States, this alliance covers dry-mesic forests of the Piedmont, low Appalachian Mountains, and the Cumberland and Interior Low Plateau, and mesic oak–hickory forests of the Blue Ridge and the interior highlands of the Ozarks and Ouachita Mountains. Associated species include *Carya glabra*, *Carya ovata*, *Carya alba*, *Fraxinus americana*, *Acer rubrum*, *Acer leucoderme*, *Cornus florida*, *Nyssa sylvatica*, *Ostrya virginiana*, *Calycanthus floridus*, *Pyrularia pubera*, *Tilia americana* var. *caroliniana*, *Oxydendrum arboreum*, and others. This alliance is found throughout the midwestern United States on moderately rich, upland sites. Typical associates include *Fraxinus americana*, *Ulmus americana*, *Tilia americana*, *Acer saccharum*, *Acer rubrum*, and more locally, *Quercus macrocarpa* and *Quercus ellipsoidalis*. Stands are found on gentle to moderately steep slopes on uplands and on steep valley sides. The soils are moderately deep to deep and vary from silts to clays and loams. The parent material ranges from glaciated till to limestone, shale, sandstone, and other bedrock types. In the midwestern United States, many stands are succeeding to types dominated by *Acer saccharum*, *Tilia americana*, *Acer rubrum*, and other mesic tree associates. This succession may be delayed by fire and grazing. In the eastern and southeastern United States, *Liriodendron tulipifera*, *Fraxinus americana*, *Acer rubrum*, and other mesic associates often increase after disturbances, such as clearcutting or windstorms, especially in the absence of fire.

**Range:** This alliance ranges from Ontario, Canada, throughout the midwestern and eastern United States, south to the very northern edges of the Western and Eastern Gulf Coastal Plains.

**States/Provinces:** AL AR CT DE GA IA IL IN KS KY MA MD ME MI MN MO MS? NC NE NH NJ NY OH OK ON PA RI SC TN VA VT WI WV

**Federal Lands:** COE (Dale Hollow?); DOD (Arnold, Fort Benning); DOE (Oak Ridge); NPS (Carl Sandburg Home, Chickamauga–Chattanooga, Great Smoky Mountains, Guilford Courthouse, Kennesaw Mountain, Kings Mountain, Natchez Trace, Ninety Six, Russell Cave, Shenandoah, Shiloh); TVA (Tellico); USFS (Bankhead, Chattahoochee, Cherokee, Daniel Boone, George Washington, Jefferson, Land Between the Lakes, Mark Twain, Nantahala, Oconee, Ouachita, Ozark, Pisgah, St. Francis, Shawnee, Sumter, Talladega, Tuskegee?, Uwharrie)

**Synonymy:** IA6j. Interior Calcareous Oak–Hickory Forest, in part (Allard 1990); Mesic Oak–Hickory Forest, in part (Foti 1994b); Submesic broadleaf deciduous forest, in part (Ambrose 1990a); Oak–Chestnut–Hickory Forest, in part (Ambrose 1990a); Acidic mesophytic forest, in part (Evans 1991); Calcareous mesophytic forest, in part (Evans 1991); Dry-Mesic Oak–Hickory Forest (Schafale and Weakley 1990); Basic Oak–Hickory Forest, Mafic Substrate Variant, in part (Schafale and Weakley 1990); Montane Oak–Hickory Forest, in part (Schafale and Weakley 1990); Basic Oak–Hickory Forest (Nelson 1986); Permesotrophic Forest, in part (Rawinski 1992); Oak–Hickory Forest, in part (Nelson 1986); T1B4aIII. *Quercus rubra*–*Quercus* spp. (Foti et al. 1994); White Oak–Black Oak–Northern Red Oak: 52, in part (Eyre 1980); White Oak: 53, in part (Eyre 1980); Oak–Hickory Forest (Swain and Kearsley 2001)

**References:** Allard 1990, Ambrose 1990a, Andreu and Tukman 1995, Evans 1991, Eyre 1980, Faber-Langendoen et al. 1996, Foti 1994b, Foti et al. 1994, Fountain and Sweeney 1985, Fralish 1988b, Fralish et al. 1991, Golden 1979, Hoagland 1997, Jones 1988a, Jones 1988b, McLeod 1988, Monk et al. 1990, Nelson 1986, Oakley et al. 1995, Oosting 1942, Rawinski 1992, Robertson et al. 1984, Schafale and Weakley 1990, Swain and Kearsley 2001, Wharton 1978

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**Identifier:** A.239

**I.B.2.N.a.36. QUERCUS PRINUS (QUERCUS COCCINEA, QUERCUS VELUTINA)  
FOREST ALLIANCE**

Rock Chestnut Oak (Scarlet Oak, Black Oak) Forest Alliance

Hopewell Furnace name: Dry Oak–Heath Forest

**Concept:** This alliance includes xeric oak forests strongly dominated by *Quercus prinus* or *Quercus prinus* with admixtures of *Quercus coccinea* and/or *Quercus velutina*, occurring in the southern and central Appalachians, Ridge and Valley, Cumberland Plateau, Piedmont, Interior Low Plateau, and possibly in the northern Appalachians. In the Piedmont and Ridge and Valley, and in areas transitional to these provinces, *Quercus stellata* and *Quercus marilandica* may be canopy associates. Other canopy/subcanopy associates include *Acer rubrum*, *Amelanchier arborea*, *Carya alba*, *Carya glabra*, *Cornus florida*, *Hamamelis virginiana*, *Magnolia fraseri*, *Nyssa sylvatica*, *Oxydendrum arboreum*, *Pinus rigida*, *Pinus strobus*, *Quercus alba*, *Quercus rubra*, *Robinia pseudoacacia*, and *Sassafras albidum*. In the Appalachians, a dense ericaceous shrub layer is characteristic, with species such as *Gaylussacia baccata*, *Gaylussacia ursina*, *Kalmia latifolia*, *Leucothoe recurva*, *Rhododendron maximum*, *Vaccinium pallidum*, and *Vaccinium stamineum*. In the upper Piedmont, *Kalmia latifolia*, *Vaccinium arboreum*, and *Vaccinium pallidum* are common. In the montane distribution of this alliance, forests of this alliance have replaced forests formerly dominated or codominated by *Castanea dentata*, and chestnut sprouts are common in the understory. Other shrub species found in forests of this alliance include *Chionanthus virginicus*, *Diospyros virginiana*, *Robinia hispida*, *Sassafras albidum*, *Styrax grandifolius*, *Symplocos tinctoria*, *Viburnum acerifolium*, *Viburnum prunifolium*, and *Viburnum rufidulum*. Herbaceous cover is typically sparse in these dry, rocky forests and species vary with geographic location. Some typical herbaceous species include *Antennaria plantaginifolia*, *Aureolaria laevigata*, *Chamaelirium luteum*, *Chimaphila maculata*, *Danthonia spicata*, *Dichantherium commutatum*, *Dichantherium dichotomum*, *Dioscorea quaternata*, *Epigaea repens*, *Galax urceolata*, *Galium latifolium*, *Gaultheria procumbens*, *Goodyera pubescens*, *Hieracium venosum*, *Lysimachia quadrifolia*, *Medeola virginiana*, *Monotropa uniflora*, *Potentilla canadensis*, *Pteridium aquilinum*, *Stenanthium gramineum*, *Uvularia puberula*, and *Uvularia sessilifolia*. These forests occur on convex, upper slopes and ridgetops, south-facing slopes, over thin, rocky, infertile soils in the Appalachians, typically below 3500 feet (1066 m), where windthrow and ice damage are common natural disturbances. In the Piedmont these forests occur on low mountains and hills, on rocky, well-drained, acidic soils, sometimes associated with outcrops of quartzite, or other resistant rock.

**Range:** This alliance occurs in the southern and central Appalachians, Ridge and Valley, Cumberland Plateau, Piedmont, Interior Low Plateau, and possibly in the northern Appalachians. It is found in Illinois, Indiana, Ohio, Connecticut, Delaware, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, Alabama, Georgia, Kentucky, North Carolina, South Carolina, and Tennessee, and possibly Maine (?), Maryland (?), Mississippi (?), and West Virginia (?).

**States/Provinces:** AL CT DE GA IL IN KY MA MD NC NJ NY OH PA RI SC TN VA WV

**Federal Lands:** DOD (Fort Knox); NPS (Carl Sandburg Home, Chickamauga–Chattanooga, Great Smoky Mountains, Harpers Ferry, Kings Mountain, Rock Creek, Russell Cave); TVA (Tellico); USFS (Bankhead, Chattahoochee, Cherokee, Daniel Boone, George Washington, Jefferson, Land Between the Lakes, Nantahala, Oconee?, Pisgah, Sumter, Talladega?, Uwharrie)

**Synonymy:** IA6d. Chestnut Oak Slope and Ridge Forest (Allard 1990); IA7d. Piedmont Monadnock Forest (Allard 1990); Appalachian sub-xeric forest, in part (Evans 1991); Chestnut Oak Forest, in part (Schafale and Weakley 1990); Piedmont Monadnock Forests, in part (Schafale and Weakley 1990); Oligotrophic Forest, in part (Rawinski 1992); *Quercus prinus*–*Quercus velutina* / *Vaccinium stamineum* Association (Fleming and Moorhead 1996); Chestnut Oak: 44, in part (Eyre 1980); Mixed Oak Forest (Swain and Kearsley 2001); Ridgetop Chestnut Oak (Swain and Kearsley 2001); Dry oak–heath forest (Fike 1999); Xeric Central Hardwood Forest (Smith 1991)

**References:** Allard 1990, Arends 1981, Callaway et al. 1987, Cooper 1963, DuMond 1970, Evans 1991, Eyre 1980, Faber-Langendoen et al. 1996, Fike 1999, Fleming and Moorhead 1996, Gibbon 1966, Golden 1974, Martin 1989, McLeod 1988, Mowbray 1966, Nelson 1986, Newell and Peet 1996a, Patterson 1994, Peet and Christensen 1980, Rawinski 1992, Rawinski et al. 1996, Schafale and Weakley 1990, Schmalzer 1978, Smith 1991, Swain and Kearsley 2001, Tobe et al. 1992, Wells 1974, Wheat 1986, Whittaker 1956

**Authors:** D. FABER-LANGENDOEN/D.J., RW, East

**Identifier:** A.248

Hopewell Furnace name: Modified Successional Forest  
(No assigned NVCS alliance; Park-specific type)

### **I.B.2.N.e. Seasonally flooded cold-deciduous forest**

#### ***I.B.2.N.e.1. ACER RUBRUM–FRAXINUS PENNSYLVANICA* SEASONALLY FLOODED FOREST ALLIANCE**

Red Maple–Green Ash Seasonally Flooded Forest Alliance

Hopewell Furnace name: Red Maple–Mixed Hardwood Palustrine Forest

**Concept:** This alliance is widely distributed in the eastern United States. Stands are dominated by broad-leaved deciduous trees and well-developed shrub and herbaceous strata. They are characterized by dense growth and a great diversity of species. Basal area can reach 40–42 m<sup>2</sup>/ha. *Acer rubrum* and *Fraxinus pennsylvanica* are consistently abundant overstory species, but *Fraxinus profunda* (in the southern parts of this alliance's range), *Liquidambar styraciflua*, *Quercus lyrata*, *Quercus bicolor*, and *Ulmus americana* occur almost as frequently, and *Nyssa aquatica* and *Taxodium distichum* occur sporadically in the southern parts of this alliance's range. *Acer saccharinum* may dominate in parts of the range. The shrub layer can include a diverse mixture including *Carpinus caroliniana*, *Cephalanthus occidentalis*, *Forestiera acuminata*, and *Ilex decidua*, but *Itea virginica* is characteristic of southern stands of this alliance. Even with dense shading, the herbaceous layer is usually well-developed, displaying a preponderance of *Boehmeria cylindrica*, *Carex* spp., *Glyceria* spp., *Juncus* spp., *Laportea canadensis*, *Leersia* spp., and *Pilea pumila*. *Vitis* spp. are characteristic vines of this community, but *Toxicodendron radicans* and *Campsis radicans* are also prominent. Sites which support stands of this alliance have level or nearly level soils that formed in water-deposited clayey or loamy sediments on floodplains of the Mississippi and other rivers and large perennial streams in the Coastal Plain. These soils are flooded or saturated for a significant portion of the growing season, and water may be ponded for most of the year in shallow depressions. Flooding can reach 1 m. Flooding occurs during the winter and spring and often extends into the growing season.

**Comments:** Stands of this alliance support a diverse assemblage of bottomland hardwoods. Perhaps the most diagnostic is the mixture of bottomland hardwoods found there. Species typical of wetter and drier sites are commonly encountered, but the diagnostic environmental feature is shallow standing water or soil saturation for a significant portion of the growing season. Slight ridges within these flooded zones provide drier habitat for less flood-tolerant species.

**Range:** This alliance is widely distributed in the eastern United States in southern Michigan, Ohio, Indiana, Illinois, Wisconsin, southeastern Missouri, eastern Arkansas (?), Georgia, Kentucky, Louisiana, Mississippi, Oklahoma, Tennessee (?), Texas, South Carolina (?), North Carolina, central-western New York and the Lake Erie Plain of Pennsylvania, West Virginia, Maryland, New Jersey, and Virginia; and in Canada in southern Ontario.

**States/Provinces:** AR CT DE IL IN KY LA MA MD ME MI MO NC NH NJ NY OH ON PA QC? RI SC TN TX VA VT WI

**Federal Lands:** NPS (Acadia, Congaree Swamp, Great Smoky Mountains); USFS (Daniel Boone?, Ouachita?, Ozark?); USFWS (Little River, Reelfoot?, San Bernard)

**Synonymy:** *Acer rubrum* forest alliance (Hoagland 1998a); *Acer rubrum–Nyssa aquatica* forest (Robertson et al. 1984); Red maple–green ash. ? (Wharton et al. 1982); Spruce–Fir Boreal Swamp (Swain and Kearsley 2001); Alluvial Red Maple Swamp (Swain and Kearsley 2001); Black Ash Swamp (Swain and Kearsley 2001); Black Ash–Red Maple–Tamarack Calcareous Seepage Swamp (Swain and Kearsley 2001)

**References:** Faber-Langendoen et al. 1996, Golet et al. 1993, Hoagland 1998a, Robertson et al. 1984, Swain and Kearsley 2001, Wharton et al. 1982

**Authors:** ECS, MP, Midwest

**Identifier:** A.316

## II. WOODLAND

### II.B.2.N.a. Lowland or submontane cold-deciduous woodland

#### II.B.2.N.a.24. *QUERCUS RUBRA*–*QUERCUS PRINUS* WOODLAND ALLIANCE

Northern Red Oak–Rock Chestnut Oak Woodland Alliance

Hopewell Furnace name: Birch Rocky Slope Woodland

**Concept:** This alliance includes woodland communities occurring on acidic, talus slopes or rocky slopes of higher elevations (e.g., from 1000–2620 feet in New England and to 4500 feet in West Virginia). Soils are shallow and acidic. *Quercus rubra* is sometimes dominant but usually occurs in association with *Quercus alba*, *Acer rubrum*, *Betula lenta*, *Quercus prinus*, and others. Canopies are often stunted. The shrub layer may include, in the northern part of the range, *Acer spicatum*, *Sambucus racemosa* var. *racemosa* (= *Sambucus racemosa* ssp. *pubens*), *Rhus typhina*, *Kalmia latifolia*, and *Hamamelis virginiana*, while in the southern part of the range, *Rhododendron catawbiense*, *Rhododendron arborescens*, *Rhododendron calendulaceum*, *Rhododendron maximum*, *Menziesia pilosa*, *Gaylussacia ursina*, *Leucothoe recurva*, *Vaccinium simulatum*, and *Viburnum nudum* var. *cassinoides* are more typical. Herbs include *Pteridium aquilinum* var. *latiusculum*, *Aralia nudicaulis*, *Maianthemum canadense*, *Oclemena acuminata* (= *Aster acuminatus*), *Corydalis sempervirens*, *Deschampsia flexuosa*, *Carex pensylvanica*, and *Polypodium virginianum*. Communities of this alliance are known from the Appalachian Mountains, from New York and New England, south to the Blue Ridge of North Carolina.

**Range:** Communities of this alliance are known from the Appalachian Mountains, from New York and New England, south to the Blue Ridge of North Carolina. This alliance is found in Connecticut, Georgia, North Carolina, Delaware, Maine, Massachusetts, New Hampshire, New York, Pennsylvania, Vermont, Virginia, and West Virginia, and possibly South Carolina (?).

**States/Provinces:** CT GA MA MD? ME NC NH NY PA SC? TN VA VT WV

**Federal Lands:** NPS (Acadia); USFS (Chattahoochee, George Washington, Jefferson, Nantahala, Pisgah)

**Synonymy:** Chestnut Oak: 44, in part (Eyre 1980); Northern Red Oak: 55, in part (Eyre 1980); Circumneutral Rocky Summit/Rock Outcrop (Swain and Kearsley 2001); Acidic Talus Forest / Woodland (Swain and Kearsley 2001); Oak–Hemlock–White Pine Forest (Swain and Kearsley 2001); Dry oak–heath woodland (Fike 1999); Ridgetop Dwarf-tree Forest, in part (Smith 1991)

**References:** Eyre 1980, Fike 1999, Smith 1991, Swain and Kearsley 2001

**Authors:** ECS, RW, East

**Identifier:** A.624

Hopewell Furnace Name: Modified Successional Woodland  
(No assigned NVCS alliance; Park-specific type)

### III. SHRUBLAND

#### III.B.2.N.a. Temperate cold-deciduous shrubland

Hopewell Furnace name: Successional Scrub–Shrub (Powerline Right-of-Way Corridor)

(No assigned NVCS alliance; Park-specific type)

#### III.B.2.N.e. Seasonally flooded cold-deciduous shrubland

##### III.B.2.N.e.3. *CEPHALANTHUS OCCIDENTALIS* SEASONALLY FLOODED SHRUBLAND ALLIANCE

Buttonbush Seasonally Flooded Shrubland Alliance

Hopewell Furnace name: Buttonbush Wetland

**Concept:** Vegetation in this alliance occurs in seasonally flooded basins in which the water level generally is beneath the soil surface by the end of the growing season. *Cephalanthus occidentalis* is the dominant species. Herbaceous species that may be present include *Carex striata*, *Glyceria* spp., *Polygonum amphibium*, and *Panicum verrucosum*. This alliance is distributed in the Coastal Plain in Maryland and Virginia and possibly along the Atlantic north to Massachusetts, the Interior Low Plateau of Tennessee, and possibly adjoining states; it also occurs in California. This alliance includes shrub vegetation of ponds over fragipan soils in southeastern central Tennessee. **Comments:** This alliance needs resolution against III.B.2.N.f *Cephalanthus occidentalis* Semipermanently Flooded Shrubland Alliance (A.1011), which is distributed throughout the Southeast and the Midwest. This description is based primarily upon information from California examples of the alliance. Further documentation and description of the alliance from other portions of its range are needed.

**Range:** This alliance is distributed in the coastal plain in Maryland and Virginia and possibly along the Atlantic north to Massachusetts, the Interior Low Plateau of Tennessee, and possibly adjoining states; it also occurs in California. This alliance includes shrub vegetation of ponds over fragipan soils in southeastern central Tennessee. In California, this alliance occurs in seasonally flooded basins throughout the inner northern and central Coast Ranges, the foothills of the Klamath, Cascade, and Sierra Nevada mountains, and in the Great Central Valley.

**States/Provinces:** AL? CA DE GA IL IN KY MA? MD MO MS? RI? TN VA

**Federal Lands:** DOD (Arnold, Fort Benning); USFS (George Washington, Mark Twain); USFWS (Felsenthal, Pond Creek)

**Synonymy:** Buttonbush Scrub, in part (Holland 1986b)

**References:** Holland 1986b, Sawyer and Keeler-Wolf 1995, Sneddon 1994

**Authors:** ECS, MOD. M. SCHINDEL, MP, East

**Identifier:** A.988

**III.B.2.N.e.7. VACCINIUM FORMOSUM–VACCINIUM FUSCATUM SEASONALLY FLOODED SHRUBLAND ALLIANCE**

Southern Highbush Blueberry–Black Highbush Blueberry Seasonally Flooded Shrubland Alliance

Hopewell Furnace name: Highbush Blueberry–Meadowsweet Wetland

(Note: alliance name may be changed to *Vaccinium formosum*–*Vaccinium fuscatum*–*Vaccinium corymbosum* Seasonally Flooded Shrubland Alliance)

**Concept:** Depressional wetlands in uplands of the Coastal Plain and extreme lower Piedmont dominated by *Vaccinium formosum*, *Vaccinium fuscatum*, and other heaths locally, such as *Lyonia ligustrina* var. *foliosiflora*, *Lyonia lucida*, and others. Other shrub/vine species which may be present include *Leucothoe racemosa*, *Smilax walteri*, and *Viburnum nudum* var. *nudum*. The shrub coverage sometimes has an open, sparse structure. Trees may be interspersed among the shrubs; these may include *Liquidambar styraciflua*, *Acer rubrum* var. *rubrum*, *Pinus palustris*, and *Pinus taeda*. Herbaceous species that may be present include *Carex crinita*, *Carex glaucescens*, *Eleocharis* sp., *Rhynchospora* sp., *Scleria* sp., and *Utricularia gibba*. *Sphagnum* spp. are present in some examples. *Vaccinium* spp. sometimes exceed 5 m in height, but are placed here.

**Range:** This alliance is found in uplands of the coastal plain and extreme lower Piedmont from New England to the Carolinas.

**States/Provinces:** CT DE MA MD NC NJ NY PA RI SC VA?

**Federal Lands:** USFS (Uwharrie)

**Synonymy:** Small Depression Pond (Schafale and Weakley 1990); Upland Pool (Schafale and Weakley 1990)

**References:** Schafale and Weakley 1990

**Authors:** A.S. WEAKLEY, MP, Southeast

**Identifier:** A.992



## V. HERBACEOUS VEGETATION

### V.A.5.N.c. Medium-tall sod temperate or subpolar grassland

#### V.A.5.N.c.103. *DACTYLIS GLOMERATA*–*RUMEX ACETOSELLA* HERBACEOUS ALLIANCE

Orchard Grass–Sheep-sorrel Herbaceous Alliance

Hopewell Furnace name: Grassland

**Concept:** This broadly defined alliance includes pasture and post-agricultural fields, and is largely composed of nonnative grasses and herbs (generally of European origin). Physiognomically, these grasslands are generally comprised of mid-height (1-3 feet tall) grasses and forbs, with occasional scattered shrubs. Species composition varies from site to site, depending on land-use history, and perhaps soil type, but in general, this vegetation is quite wide-ranging in northeastern and midwestern states, and possibly at higher elevations in the southeastern states. In addition to *Dactylis glomerata* and *Rumex acetosella* these grassy fields are characterized by *Symphyotrichum* spp. (including *Symphyotrichum lateriflorum* (= *Aster lateriflorus*) and *Symphyotrichum novae-angliae* (= *Aster novae-angliae*)), *Rudbeckia hirta*, *Pteridium aquilinum*, *Chenopodium album*, *Asclepias syriaca*, *Andropogon virginicus*, *Schizachyrium scoparium*, *Phytolacca americana*, *Phleum pratense*, *Poa pratensis*, *Poa compressa*, *Elymus repens* (= *Agropyron repens*), *Bromus inermis*, *Solidago* spp. (including *Solidago rugosa*, *Solidago nemoralis*, *Solidago juncea*, *Solidago canadensis*, *Solidago altissima*), *Euthamia graminifolia*, *Oenothera biennis*, *Potentilla simplex*, *Daucus carota*, *Ambrosia artemisiifolia*, *Hieracium* spp., *Taraxacum officinale*, *Vicia cracca*, *Trifolium* spp., and many others. Communities of this alliance occur throughout the northeastern United States and beyond.

**Comments:** Need to clarify the distribution and application of *Lolium* (*arundinaceum*, *pratense*) Herbaceous Alliance (A.1213) and *Dactylis glomerata*–*Rumex acetosella* Cultivated Herbaceous Alliance (A.1190). Is *Dactylis* favored to the north, and *Festuca* to the south?

**Range:** This alliance is found in Maine, New Hampshire, Vermont, New York, Massachusetts, Connecticut, Rhode Island, Pennsylvania, New Jersey, Delaware, Maryland, West Virginia, and Virginia.

**States/Provinces:** CT DE MA MD ME NH NJ NY PA RI TN VA VT WV

**References:**

**Authors:** ECS, RW, East

**Identifier:** A.1190

## **V.B.2.N.f. Saturated temperate perennial forb vegetation**

### **V.B.2.N.f.13. SYMPLOCARPUS FOETIDUS–CALTHA PALUSTRIS SATURATED HERBACEOUS ALLIANCE**

Skunk Cabbage–Yellow Marsh-marigold Saturated Herbaceous Alliance

Hopewell Furnace name: Skunk Cabbage–Golden Saxifrage Forested Seep

**Concept:** This alliance, found in the Great Lakes region and northeastern Great Plains, occurs where circumneutral or slightly calcareous groundwater seeps to the surface. This alliance is dominated by forbs. *Angelica atropurpurea*, *Caltha palustris*, and *Symplocarpus foetidus* are usual dominants. Other species that may be found include *Carex lacustris*, *Carex stricta*, *Glyceria striata*, *Impatiens capensis*, and *Thelypteris palustris*. Shrubs and trees from surrounding vegetation types sometimes occur. Where the cover of these becomes significant, the site is classified as another alliance. Typical woody species include *Acer rubrum*, *Fraxinus nigra*, and *Thuja occidentalis*. Stands of this alliance are found on lower slopes of glacial moraines, ravines, and terraces around seepage areas. Peat sometimes accumulates to a depth of 1 m. Other sites have little organic material, with groundwater typically welling up through carbonate encrusted gravel.

**Comments:** This alliance often occurs as inclusions within other, usually forested, vegetation. As currently defined, this alliance includes only those sites dominated by herbaceous species. Sites that are floristically very similar but occur under a tree canopy are treated as forested seeps and swamps.

**Range:** This alliance is found in the Midwest in Ohio, Indiana, Illinois, Michigan, Minnesota, and Iowa and in Canada in Ontario.

**States/Provinces:** IA? IL IN MI MN OH? ON

**References:** Faber-Langendoen et al. 1996, MNNHP 1993, White and Madany 1978

**Authors:** MCS, Midwest

**Identifier:** A.1694